



Code	Subject Title	Cr. Hrs	Semester
ZOOL-301	Cell and Molecular Biology II	3	V
Year	Discipline		
3	Zoology		

Nucleus:

Chromatin, heterochromatin, euchromatin, chromosome structure with reference to coiling and nucleosome during different phases of cell cycle, **DNA physical and chemical structure**, characteristics of DNA, **DNA replication** (mechanism, DNA replication in prokaryotes specially with reference to variety of DNA polymerases and other proteins involved, DNA replication in Eukaryotes with special reference to DNA polymerases, concept of Replicons etc.), DNA repair, **Transcription** (variety of RNA and their characteristics, synthesis of mRNA, rRNA and tRNA with special reference to enzymes, involved, RNA splicing, split genes, concept of Ribozymes and posttranscriptional processing), RNA transduction, Genetic code, point mutations, **Translation** (with reference to the specific role of Ribosomes, various factors, and posttranslational processing), **Regulation of Gene Expression** (enzyme induction, enzyme repression, role of promoter and operator to be elucidated taking examples of Lac operon and Trip Operon, Gene Regulation in Eukaryotes with reference to elaborate promoter and diverse transcription factors involved, concept of examples of Transcriptional Regulation and Translational Regulation). **Nuclear Envelope**, Nucleolus

Recombinant DNA technology

General Principles, molecular tools involved (vectors, enzymes, expression system) DNA sequencing, chromosome walking, PCR techniques.

Role of Genetic Engineering in Economic Development in the areas of **Medicine and Human Health** (Therapeutic Drug, Vaccines, Monoclonal antibodies, Gene therapy, Animal Cloning, Human Genome Project, Stem Cells, Transgenics Ethical issues), **Agriculture** (Livestock Health, increase in agricultural produce), **Industry** (organic solvents, petroleum industry, ore leaching etc.).

Textbook

1. De Robertis and De Robertis. (Latest Edition) Cell and Molecular Biology. Lea and Fibiger, New York.

Additional Readings

1. Karp, G. 2007. Cell and Molecular Biology. John Wiley & Sons. Inc. USA.
2. Lodisch, H., Darnell, Jr., J. and Baltimore D. 2000. Molecular Cell Biology. Scientific American Inc. New York.
3. Weaver. F.F. 2005. Molecular Biology 3rd Ed. The McGraw Hill companies Inc. International Edition.